REMARKS

Claims 1 through 16 and 23 through 25 have been cancelled without prejudice. The remaining claims in the case are claims 17 through 22.

Claims 17 through 22 were rejected under 35 U.S.C. § 103 (a) as unpatentable over Harada *et al.* in view of Viterbi *et al.* This rejection is respectfully traversed.

The Harada decoding method and the Viterbi decoder shown in the Viterbi reference are incompatible and it would not have been obvious or even desirable to attempt to incorporate the Viterbi decoder disclosed in the Viterbi paper into the system disclosed by Harada *et al.* In Harada *et al.*, values are assigned to a received signal as determined by the signal's relative position in a vector constellation using gray code mapping based upon 16 QAM (FIG. 4). Decisions, as to both value and reliability of the bits of the signal, are made based upon the position of the signal relative to the map of values shown in FIG. 4. These values are estimates based upon first, whether the signal point is located in a space in which certain bits vary or do not vary and, second, with respect to the relative position of the signal from the I and Q axes. Thus, for certain bits the decision value is based solely upon whether corresponding bit positions do not change within the four corners of the region in which the signal lies. Where the bit values do change within that space, the corresponding bits are subject to a soft decision depending upon the position of the signal along the I and Q axes. This is the sole method disclosed in Harada for assigning hard decision bit values and soft decision values and reliability to received signal bits.

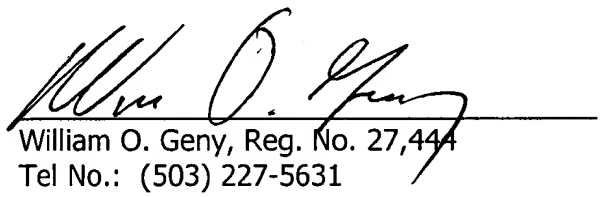
By contrast, claim 17 does not use this method. Instead, in claim 17 a reliability comparison is made between at least one constellation vector that is proximate to the signal. A hard decision value is assigned to the bit associated with a greater reliability as compared to the constellation vector and a soft decision value is assigned to a bit that is associated with a lesser reliability when compared to the constellation vector.

Claim 18 adds that the reliability is measured by a log likelihood ratio. It would be completely inappropriate to attempt to import the log likelihood ratio method of Viterbi for

measuring reliability into Harada's method. There is no teaching or suggestion in Harada that such a methodology would be useful or desirable. Harada shows no method for assigning hard versus soft decision values to bits other than what is expressly disclosed and it cannot be assumed that one of ordinary skill in the art would have completely reworked Harada's methodology in order to incorporate the teachings of Viterbi. In fact, such a reworking of Harada would require a complete abandonment of Harada's method for assigning soft decision reliability numbers or of even deciding whether or not a bit is subject to hard decision versus soft decision. There is simply no teaching in either Harada or Viterbi for doing so. Further, there is nothing in the prior art considered as a whole that would motivate one of ordinary skill in the art to alter the Harada method so as to accommodate a reliability determination for certain bits based upon a log likelihood ratio as disclosed in Viterbi.

Thus, claims 17 through 22 are patentable over the prior art of record and applicant requests that the case be passed to issue.

Respectfully submitted,



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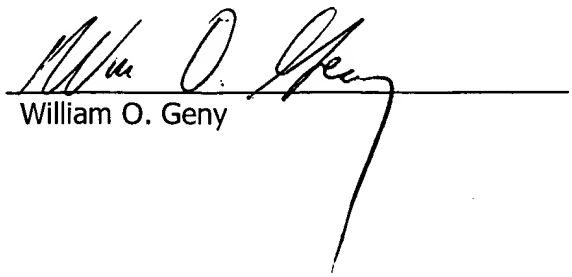
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



Dated: September 20, 2004

William O. Geny